AMENDMENTS TO THE CLAIMS:

Please AMEND the claims as indicated below:

1. (Withdrawn) A reverse spreading device for reversely spreading complex base band signal, one being composed of an I (In-phase signal) component and another being composed of a Q (Quadrature phase signal) component and each being spread using spread codes of n-pieces of chips for one symbol signal comprising:

a first correlator having first delay devices whose number is an integral multiple of n-1 and which sequentially shift said base band signal composed of said I component by delaying it at a predetermined time interval, having n-pieces of first multipliers each performing a multiplication between said base band signal composed of said I component shifted by said first delay devices and a spread code and having m-pieces of first adders each performing integration of an output from k-pieces of said first multipliers out of n-pieces of said first multipliers and outputting the result of said integration as an intermediate signal composed of said I component (m=n/k);

a second correlator having second delay devices whose number is the same as that of chips for one symbol signal sequentially shifted by delaying said base band signal composed of said Q component at a predetermined time interval, having n-pieces of second multipliers each performing a multiplication between said base band signal composed of said I component sequentially shifted by said second delay devices and said spread code and having m-pieces of second adders each performing integration of an output from k-pieces of said first multipliers out of n-pieces of said first multipliers and outputting the result of said integration as an intermediate signal composed of said Q component;

m-pieces of phase rotators each performing a rotation correction by phase-rotating m-pieces of said intermediate signals each being composed of said I component produced by each of said first correlators and m-pairs of complex intermediate signals containing m-pieces of intermediate signals composed of said Q component produced by said each of said second correlators, on a complex plane at a phase rotation angle at m-stages each being slid by a reference rotation angle for every pair of said complex intermediate signals;

a first adder to perform calculation of a correlation value composed of said I component by doing integration of said I component of said m-pieces of said complex intermediate signals obtained after said rotation correction is made by each of said phase rotators; and

a second adder to perform calculation of a correlation value composed of said Q component by doing integration of said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction of each of said phase rotators is made.

2. (Withdrawn) A reverse spreading device for reversely spreading complex base band signals, one being composed of an I (In-phase signal) component and another being composed of a Q (Quadrature phase signal) component and each being spread using spread codes of n-pieces of chips for one symbol signal comprising:

a first multiplier to sequentially perform a multiplication between base band signals composed of said I component and said spread codes of n-pieces of chips;

a first correlator to produce m-pieces of intermediate signals composed of said I component by sequentially integrating said multiplied value obtained by said first multiplier for every k-pieces and by using said multiplied value as said intermediate signal and to output them as (m=n/k);

a second multiplier to sequentially perform a multiplication between said base band signals composed of said Q component and said spread codes of n-pieces of chips;

a second correlator to produce m-pieces of intermediate signals composed of said Q component by sequentially integrating said multiplied value obtained by said first multiplier for every k-pieces multiplied values and by using said multiplied value as said intermediate signals and to output them;

a phase rotator to perform a rotation correction by phase-rotating m-pieces of complex intermediate signals containing said intermediate signal composed of said I component and said intermediate signal each composed of said Q component on a complex plane at a phase rotation angle at m-stages each being slid by a reference rotation angle for every pair of said complex intermediate signals;

a first adder to perform calculation of a correlation value composed of said I component by doing integration of said I component of said m-pieces of said complex intermediate signal obtained after said rotation correction by each of said phase rotators is made; and

a second adder to perform calculation of a correlation value composed of said Q component by doing integration of said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction by each of said phase rotators is made.

3. (Currently Amended) A reverse spreading device for reversely spreading a complex base band signals, ~~comprising one base band signal being composed of~~ which was spread using spread codes, and includes an ~~I (I~~in-phase signal (I) component and ~~another base band signal being composed of~~ a ~~Q (Q~~quadrature phase signal (Q) component that each include amplitude information, ~~and each base band signal being spread using spread codes of n-pieces of chips for one symbol signal~~ the device comprising:

a frequency error correcting device configured to receive the complex base band signal, count ~~how many~~a number of chips of ~~said~~ the complex base band signal~~s to be inputted~~, and ~~to perform a rotation correction in a step-by-step manner by rotating~~sequentially rotate a phase of ~~said~~ the complex base band signals on a complex plane by~~at a~~ step number multiple of a phase angle, wherein the phase angle equals ~~phase rotation angle at m-stages each being slid by a reference rotation angle being an angle obtained by dividing~~ a rotation angle (2π) ~~of a revolution to~~ divided by M portions, ~~every time~~when ~~a count of~~ the number of chips increases by K[[-chips]] to produce a rotation corrected complex base band signal, wherein the frequency error correcting device maintains the amplitude information of the I and Q components of the complex base band signal in the rotation corrected complex base band signal;

a spread code multiplier configured to receive~~multiply~~ ~~each of~~ the rotation corrected complex base band signal~~s~~, and multiply the rotation corrected complex base band signal ~~obtained after the rotation correction by said frequency error correcting device is made,~~ by ~~said~~ the spread codes to produce a plurality of multiplied values; and

~~two~~ a plurality of accumulative adders configured to receive the plurality of multiplied values, and ~~produce a correlation value composed of said I component and a correlation value composed of said Q component by performing~~ accumulative addition of the multiplied values ~~from said spread code multiplier for one~~over a symbol period for ~~each of said~~the I component and the~~or~~ Q component to produce a correlation value for the I component and a correlation value for the Q component, respectively.

4. (Currently Amended) The reverse spreading device ~~according to~~of Claim 3, wherein ~~said~~ the frequency error correcting device ~~is composed of~~comprises:

a chip number counter configured to ~~sequentially~~ count ~~how many~~ the number of chips of ~~said~~ the complex base band signal, ~~to be inputted~~ and ~~to~~ provide an instruction for incrementing ~~every time~~ when ~~count~~the number of chips increases by K[[-1]] chips;~~, of~~

a step number counter configured to receive the instruction for incrementing, and according to the instruction for incrementing, ~~to~~ increase ~~said~~ the step number by one if the ~~outputted~~ step number ~~is~~ equals a number other than M-1, and ~~to~~ return ~~said~~ the step number to 0 if the~~said~~ step number ~~is~~ equals M-1 ~~in accordance with said instruction for incrementing fed from said chip number counter~~; and ~~of~~

a phase rotator configured to ~~perform a rotation correction by~~ sequentially ~~rotating~~ rotate ~~a~~ the phase of ~~said~~ the complex base band signals ~~at~~ by the step number multiple of the ~~a~~ phase ~~rotation~~ angle ~~corresponding to a step number fed from said step number counter, out of phase rotation angles at M-stages slid by said reference rotation angle~~.

5. (Withdrawn) The timing detecting device comprising said reverse spreading device claimed in Claim 1 and a peak detecting circuit to detect spreading timing based on sizes of correlation values of said I component and said Q component obtained by said reverse spreading in said reverse spreading device.

6. (Withdrawn) The channel estimating device comprising said reverse spreading device claimed in Claim 1 and a rotation correcting circuit to detect a phase error contained in a complex symbol obtained by said reverse spreading device and to perform correction of said phase error.

7. (Withdrawn) The timing detecting device comprising said reverse spreading device claimed in Claim 2 and a peak detecting circuit to detect spreading timing based on sizes of correlation values of said I component and said Q component obtained by said reverse spreading in said reverse spreading device.

8. (Withdrawn) The channel estimating device comprising said reverse spreading device claimed in Claim 2 and a rotation correcting circuit to detect a phase error contained in a complex symbol obtained by said reverse spreading device and to perform correction of said phase error.

9. (Currently Amended) A timing detecting device, comprising:

~~said~~ the reverse spreading device ~~claimed in~~of Claim 3; and

a peak detecting circuit configured to receive the correlation value of the I component and the correlation value of the Q component, and detect spreading timing ~~based on~~as a function of sizes of the correlation values of ~~said~~ the I and Q components~~ and said Q component obtained by said reverse spreading in said reverse spreading device~~.

10. (Currently Amended) A channel estimating device, comprising:

~~said~~ the reverse spreading device ~~claimed in~~of Claim 3 further configured to obtain a complex symbol; and

a rotation correcting circuit configured to receive the complex symbol, detect a phase error contained in ~~a~~ the complex symbol, ~~obtained by said reverse spreading device and to~~ perform correction of ~~said~~ the phase error.

11. (Withdrawn) A method for measuring a frequency error being a difference between a reference frequency of a receiver and a reference frequency of a sender comprising steps of:

shifting sequentially a base band signal composed of an I (In-phase signal) component and a base band signal composed of a Q (Quadrature phase signal) component and performing a multiplication between said shifted said base band signals each being composed of said I component or said Q component;

performing integration of k-pieces of multiplied values out of n-pieces of multiplied values obtained and producing m-pieces of intermediate signals composed of an I component (m=n/k);

performing a rotation correction by rotating phases of m-pairs of complex intermediate signals including m-pieces of intermediate signals composed of said I component and m-pieces

of intermediate signals composed of said Q component at a phase rotation angle at m-stages each being slid by a reference rotation angle for every one pair of complex intermediate signals;

calculating a correlation value of said I component and a correlation value of said Q component by integrating said I component and said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction is made; and

calculating a power value of a complex symbol based on said correlation values of said I component and said Q component and selecting said reference rotation angle so that said power value becomes maximum and then detecting said frequency error based on said reference rotation angle selected.

12. (Withdrawn) A method for measuring a frequency error being a difference between a reference frequency of a receiver and a reference frequency of a sender comprising steps of:

performing a multiplication between base band signals, one being composed of an I component of n-pieces of chips and another being composed of a Q component of n-pieces of chips and spread code of n-pieces of chips and producing m-pieces of intermediate signals, one being composed of said I component and said Q component by integrating a multiplied value for every k-pieces of said multiplied value and to use an integrated value as an intermediate signal (m=n/k) ;

performing a rotation correction by rotating phases of m-pairs of complex intermediate signals including m-pieces of intermediate signals composed of said I component and m-pieces of intermediate signals composed of said Q component at a phase rotation angle at m-stages each being slid by a reference rotation angle for every one pair of complex intermediate signals;

calculating a correlation value of said I component and a correlation value of said Q component by integrating said I component and said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction is made; and

calculating a power value of a complex symbol based on said correlation values of said I component and said Q component and selecting said reference rotation angle so that said power value becomes maximum and then detecting said frequency error based on said reference rotation angle selected.

13. (Currently Amended) A method for measuring a frequency error, ~~being~~ which includes a difference between a reference frequency of a receiver and a reference frequency of a sender, in a complex base band signal that includes I and Q signal components, a complex symbol, and was spread using spread codes, the method comprising the steps of:

counting ~~how many~~the number of chips of the complex base band signal~~s are to be inputted~~;

performing a rotation correction ~~in a step-by-step manner~~ by sequentially rotating a phase of ~~said~~ the complex base band signal on a complex plane by a step number multiple of a phase angle, wherein the phase angle equals ~~at a phase rotation angle at m stages each being slid by a reference rotation angle being an angle obtained by dividing~~ a rotation angle (2π) ~~of a revolution to~~divided by M portions, ~~every time said~~when the ~~counted~~ number of ~~the~~ chips increases by K[[-chips]] to produce a rotation corrected complex base band signal, wherein an amplitude information of the complex base band signal is maintained in the rotation corrected complex base band signal;

multiplying the rotation corrected complex base band signals by the spread ~~signals~~ codes ~~obtained after the rotation correction is made~~to produce a plurality of multiplied values ~~by said frequency error correcting device~~;

producing a correlation value of the I component and a correlation value of the Q component by adding the plurality of multiplied values ~~fed from said spread code multiplier~~ in an accumulative manner over a symbol period for ~~every~~ the I component and ~~every~~ the Q component ~~during one symbol period~~:

calculating a power value of the complex symbol based on the correlation values of ~~said~~ the I component and ~~said~~ the Q component; ~~and~~

selecting ~~said~~ the ~~reference~~ step number multiple of the ~~rotation~~ phase angle ~~so that the~~for which the power value ~~becomes~~ is maximum; and

~~then~~ detecting said frequency error based on the step number multiple for which the power value is maximum~~said reference rotation angle selected~~.

14. (Withdrawn) An AFC (Automatic Frequency Control) method to control a frequency of a reference frequency signal of a mobile station so that a frequency error measured by said frequency error measuring method claimed in claim 11.

15. (Withdrawn) An AFC (Automatic Frequency Control) method to control a frequency of a reference frequency signal of a mobile station so that a frequency error measured by said frequency error measuring method claimed in claim 12.

16. (Currently Amended) A method ~~in accordance with claim 13~~ for ~~AFC (A~~automatic ~~Frequency~~ frequency ~~Control~~control~~)~~ of a reference signal of a mobile station, comprising:

performing the method for measuring a frequency error of Claim 13; and ~~further comprising the step of:~~

controlling ~~the~~ a frequency of ~~a~~ the reference frequency signal ~~of the mobile station~~ so that the frequency error ~~detected in the calculating step~~ is reduced.